MS-6791 (v1.X) M-ATX Mainboard

User's Guide

Version 1.0
G52-M6791X1

Manual Rev: 1.0
Release Date: July 2003

CE N1996

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Notice 1
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2
Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

Micro-Star International MS-6791

FC **Tested to comply with FCC Standard**

For Home or Office Use

Copyright Notice

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Revision History

Revision	Revision History	Date
V1.0	First release for PCB 1.X	July 2003

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

- Visit the MSI website for FAQ, technical guide, BIOS updates, driver updates, and other information: **http://www.msi.com.tw/**
- Contact our technical staff at: **support@msi.com.tw**

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment has not work well or you can not get it work according to User's Manual.
    - The equipment has dropped and damaged.
    - The equipment has obvious sign of breakage.
12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60^0C (140^0F), IT MAY DAMAGE THE EQUIPMENT.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

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Getting Started

Thank you for purchasing the MS-6791 v1.x M-ATX mainboards. The MS-6791 is a superior computer motherboard based on SiS648FX/661FX and SiS963/963L chipsets for optimal system efficiency. Designed to fit the advanced Intel® Pentium® 4 Northwood/Prescott processors in the 478 pin package, the MS-6791 delivers a high performance and professional desktop platform solution.

Mainboard Specifications

CPU

- ➤ Supports Socket 478 for P4 processor with 400/533/800 MHz (100/133/200 MHz QDIR)
- ➤ Core frequency up to 3.2GHz or above

Chipset

- ➤ SiS® 648FX/661FX chipsets
  - Supports Intel Pentium 4 processors with data transfer rate up to 800MHz
  - Supports 64-bit high performance DDR400/DDR333/DDR266 memory controller
  - Supports AGP 8X/4X interface at 0.8v or 4x at 1.5v with fast write transaction
  - Supports on-board graphics core (SiS 661FX only)
- ➤ SiS® 963/963L chipsets
  - Dual-IDE ATA 66/100/133
  - ACPI & PC2001 compliant enhanced power management
  - Integrated audio controller with AC97 interface
  - Integrated high speed USB 2.0 controller, 480Mb/s

Main Memory

- ➤ Supports two 184-pin DDR 200/266/333/400 DIMMs
- ➤ Supports up to 2GB memory size without ECC

Slots

- ➤ One AGP (Accelerated Graphics Port) slot
  - AGP specification compliant
  - Supports AGP 3.0 4x/8x
- ➤ Three 32-bit PCI bus slots

On-Board IDE

- ➤ An IDE controller on the SiS® 963/963L chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA66/100/133 operation modes
- ➤ Can connect up to 4 IDE devices

On-Board Peripherals

- ➤ On-Board Peripherals include:
  - 1 floppy port supports 1 FDDs with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes

- 2 serial ports (COM A + COM B)
- 1 parallel port supports SPP/EPP/ECP mode
- 1 audio port (Line-in, Line-out, Mic-in)
- 6 high speed USB 2.0 ports (Rear * 4/ Front * 2)
- 1 IrDA connector for SIR
- 1 RJ-45 LAN jack (Optional)

Audio

➤ 6-channel audio codec RealTek ALC650/655 (Optional)
➤ 2-channel audio codec RealTek ALC202A (Optional)

LAN (Optional)

➤ Realtek 8100C

BIOS

➤ The mainboard BIOS provides "Plug & Play" BIOS which detects the peripheral devices and expansion cards of the board automatically.
➤ The mainboard provides a Desktop Management Interface (DMI) function which records your mainboard specifications.

Dimension

➤ M-ATX Form Factor: 24.4cm (L) x 24.4cm (W)

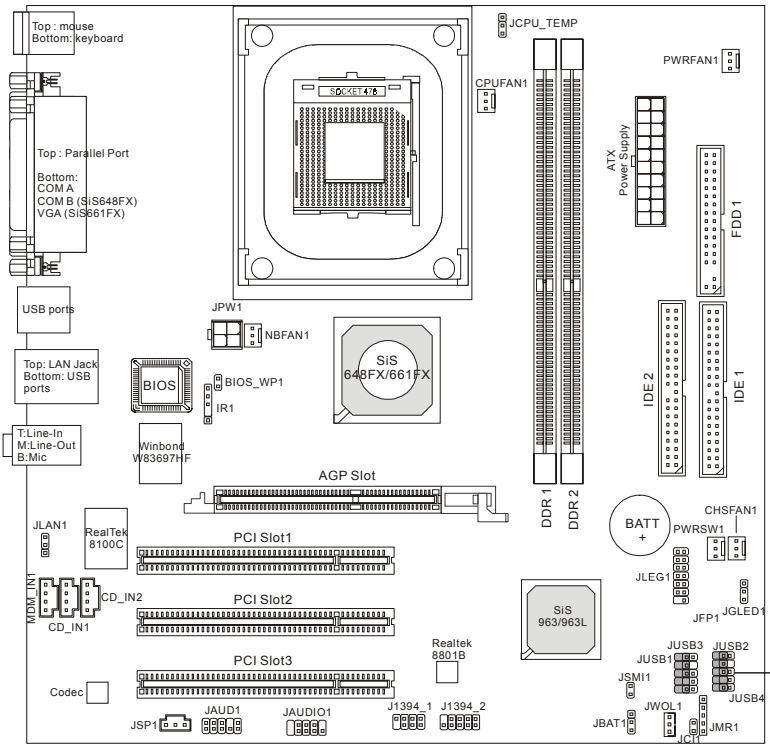
Mounting

➤ 8 mounting holes

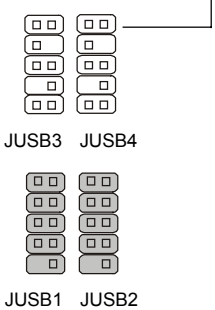
Others

➤ ACPI support, including STR/STD (S3/S4)
➤ Support WOM/WOL
➤ PC2001 compliant

Mainboard Layout



MS-6791 v1.X M-ATX Mainboard

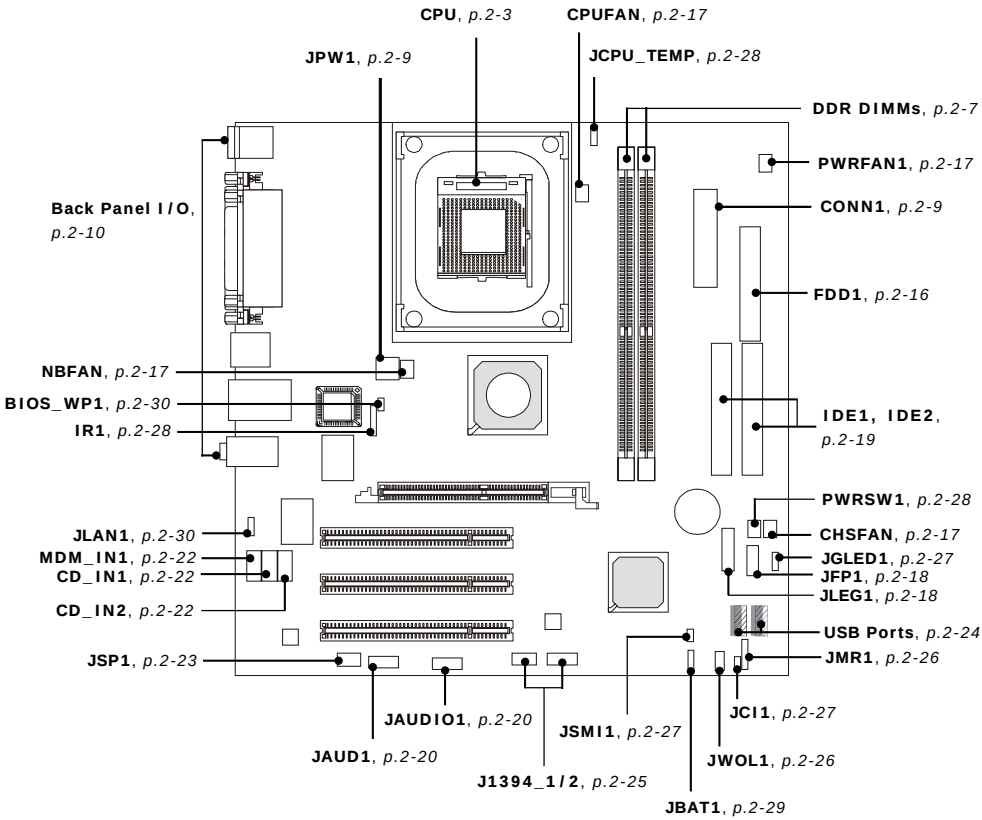


Hardware Setup

This chapter tells you how to install the CPU, memory modules, and expansion cards, as well as how to setup the jumpers on the mainboard. Also, it provides the instructions on connecting the peripheral devices, such as the mouse, keyboard, etc.

While doing the installation, be careful in holding the components and follow the installation procedures.

Quick Components Guide



Central Processing Unit: CPU

The mainboard supports Intel® Pentium® 4 Northwood/Prescott processor in the 478 pin package. The mainboard uses a CPU socket called PGA478 for easy CPU installation. When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not find the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

CPU Core Speed Derivation Procedure

If	CPU Clock	=	100MHz
	Core/Bus ratio	=	16
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	100MHz x 16
		=	1.6GHz

Memory Speed/CPU FSB Support Matrix

FSB \ Memory	DDR266	DDR333	DDR400
400MHz	OK	OK	N/A
533MHz	OK	OK	N/A
800MHz	N/A	OK	OK

MSI Reminds You...

Overheating

Overheating will seriously damage the CPU and system, always make sure the cooling fan can work properly to protect the CPU from overheating.

Overclocking

This motherboard is designed to support overclocking. However, please make sure your components are able to tolerate such abnormal setting, while doing overclocking. Any attempt to operate beyond product specifications is not recommended. ***We do not guarantee the damages or risks caused by inadequate operation or beyond product specifications.***

CPU Installation Procedures for Socket 478

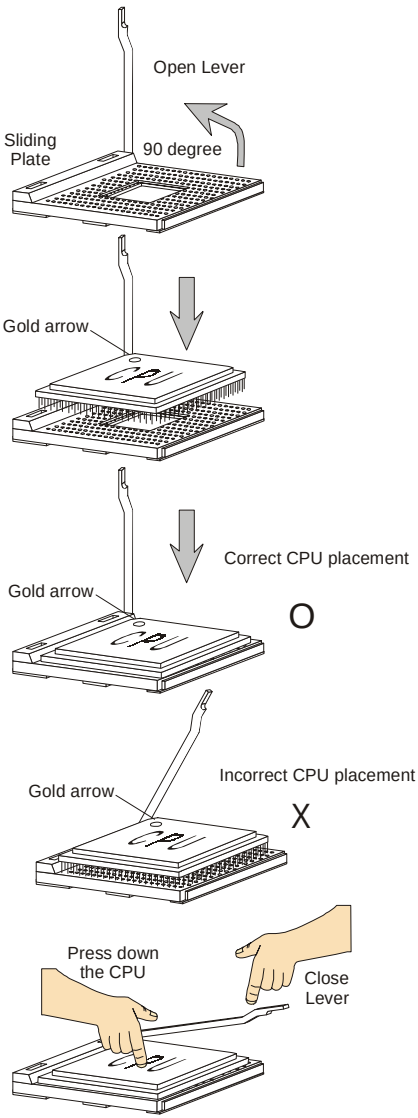
1. Please turn off the power and unplug the power cord before installing the CPU.

2. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90-degree angle.

3. Look for the gold arrow. The gold arrow should point towards the lever pivot. The CPU can only fit in the correct orientation.

4. If the CPU is correctly installed, the pins should be completely embedded into the socket and can not be seen. Please note that any violation of the correct installation procedures may cause permanent damages to your mainboard.

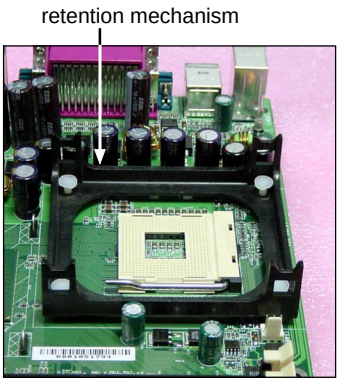
5. Press the CPU down firmly into the socket and close the lever. As the CPU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the CPU to make sure the CPU is properly and completely embedded into the socket.



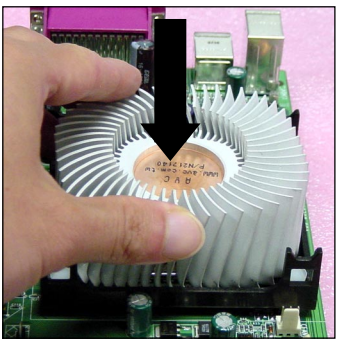
Installing the CPU Fan

As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly important. To dissipate heat, you need to attach the CPU cooling fan and heatsink on top of the CPU. Follow the instructions below to install the Heatsink/Fan:

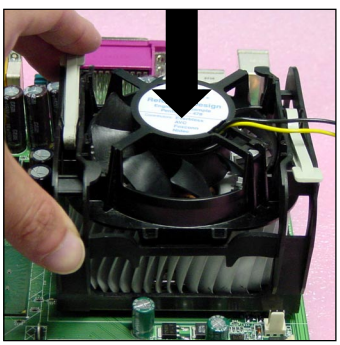
1. Locate the CPU and its retention mechanism on the motherboard.



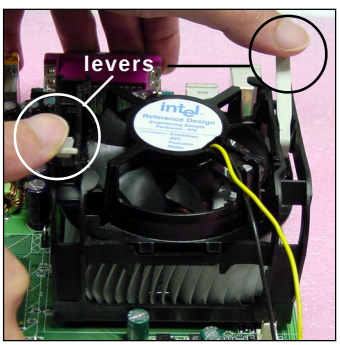
2. Position the heatsink onto the retention mechanism.



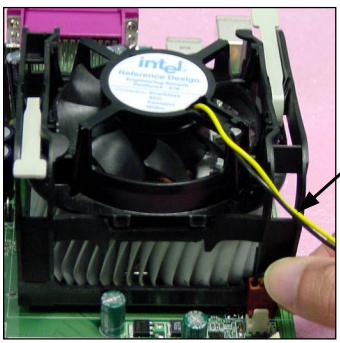
3. Mount the fan on top of the heatsink. Press down the fan until its four clips get wedged in the holes of the retention mechanism.



4. Press the two levers down to fasten the fan. Each lever can be pressed down in only ONE direction.



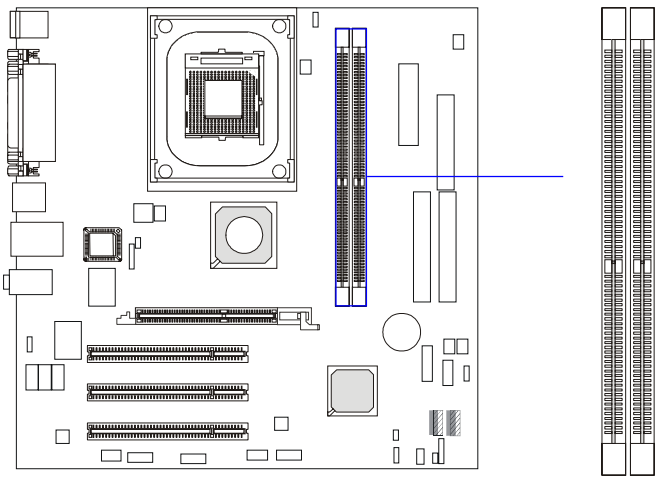
5. Connect the fan power cable from the mounted fan to the 3-pin fan power connector on the board.



NOTES

Memory

The mainboard provides 2 slots for 184-pin DDR SDRAM DIMM (Double In-Line Memory Module) modules and supports the memory size up to 2GB. You can install PC3200/DDR400, PC2700/DDR333, PC2100/DDR266 modules on the DDR DIMM slots (DIMM 1~2).



DDR Slots

Introduction to DDR SDRAM

DDR (Double Data Rate) SDRAM is similar to conventional SDRAM, but doubles the rate by transferring data twice per cycle. It uses 2.5 volts as opposed to 3.3 volts used in SDR SDRAM, and requires 184-pin DIMM modules rather than 168-pin DIMM modules used by SDR SDRAM. High memory bandwidth makes DDR an ideal solution for high performance PC, workstations and servers.

DDR DIMM Module Combination

Install at least one DIMM module on the slots. Memory modules can be installed on the slots in any order. You can install either single- or double-sided modules to meet your own needs.

Memory modules can be installed in any combination as follows:

Slot	Memory Module	Total Memory
DIMM 1 (Bank 0 & 1)	S/D	64MB~1GB
DIMM 2 (Bank 2 & 3)	S/D	64MB~1GB
Maximum System Memory Supported		64MB~2GB

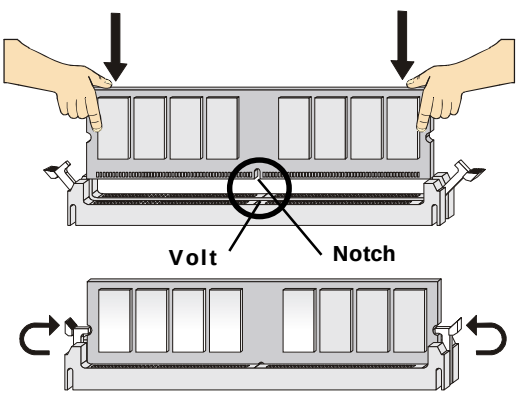
S: Single Side **D: Double Side**

Installing DDR Modules

1. The DDR DIMM has only one notch on the center of module. The module will only fit in the right orientation.
2. Insert the DIMM memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the socket.

MSI Reminds You...
You can barely see the golden finger if the module is properly inserted in the socket.

3. The plastic clip at each side of the DIMM slot will automatically close.



Power Supply

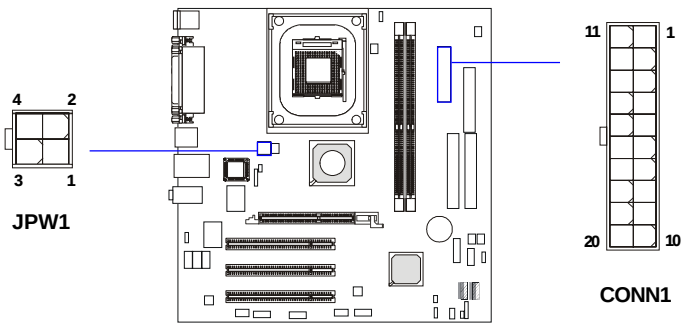
The mainboard supports ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

ATX 20-Pin Power Connector: CONN1

This connector allows you to connect to an ATX power supply. To connect to the ATX power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.

ATX 12V Power Connector: JPW1

This 12V power connector is used to provide power to the CPU.



JPW1 Pin Definition

PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

CONN1 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5V_SB	19	5V
10	12V	20	5V

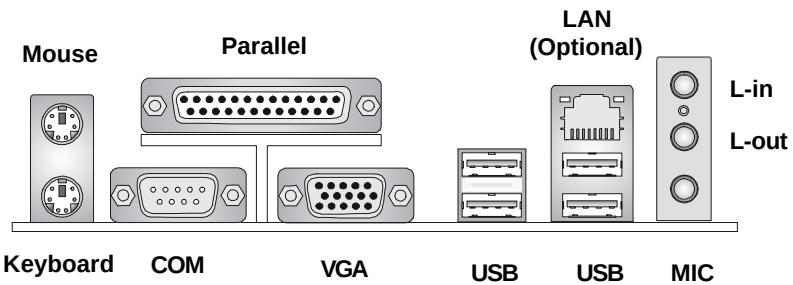
MSI Reminds You...

Power supply of 300 (and up) watt is highly recommended for system stability.

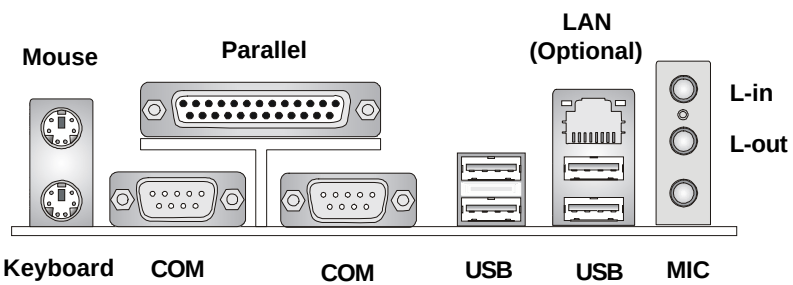
Back Panel

The back panel provides the following connectors:

For SiS 661FX

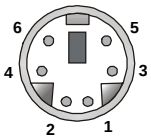


For SiS 648FX



Keyboard Connector

The mainboard provides a standard PS/2® keyboard mini DIN connector for attaching a PS/2® keyboard. You can plug a PS/2® keyboard directly into this connector.



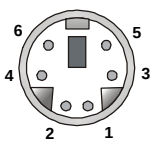
PS/2 Keyboard (6-pin Female)

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	Keyboard DATA	Keyboard DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Keyboard Clock	Keyboard clock
6	NC	No connection

Mouse Connector

The mainboard provides a standard PS/2® mouse mini DIN connector for attaching a PS/2® mouse. You can plug a PS/2® mouse directly into this connector. The connector location and pin assignments are as follows:



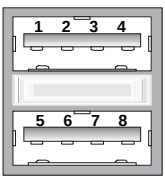
PS/2 Mouse (6-pin Female)

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	Mouse DATA	Mouse DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Mouse Clock	Mouse clock
6	NC	No connection

USB 2.0 Connectors

The mainboard provides an OHCI (Open Host Controller Interface) Universal Serial Bus root for attaching USB devices such as keyboard, mouse or other USB-compatible devices. You can plug the USB device directly into the connector.



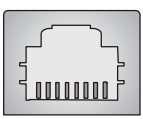
USB Ports

USB Port Description

PIN	SIGNAL	DESCRIPTION
1	VCC	+5V
2	-Data 0	Negative Data Channel 0
3	+Data0	Positive Data Channel 0
4	GND	Ground
5	VCC	+5V
6	-Data 1	Negative Data Channel 1
7	+Data 1	Positive Data Channel 1
8	GND	Ground

RJ-45 LAN Jack (Optional)

The mainboard provides one standard RJ-45 jack for connection to Local Area Network (LAN). You can connect a network cable to the LAN jack.



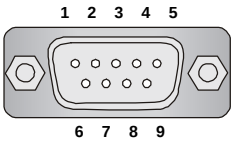
RJ-45 LAN Jack

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	TDP	Transmit Differential Pair
2	TDN	Transmit Differential Pair
3	RDP	Receive Differential Pair
4	NC	Not Used
5	NC	Not Used
6	RDN	Receive Differential Pair
7	NC	Not Used
8	NC	Not Used

Serial Port Connectors: COM A & COM B

The mainboard offers two 9-pin male DIN connectors as serial port COM A & COM B. The ports are 16550A high speed communication ports that send/receive 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connectors.



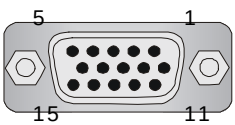
9-Pin Male DIN Connector

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready)
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicate

VGA Connector

The mainboard provides a DB 15-pin female connector to connect a VGA monitor.

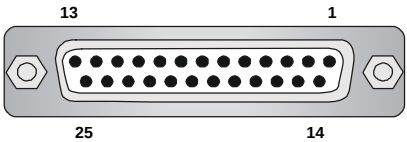


VGA Connector
(DB 15-pin)

Pin	Signal Description
1	RED
2	GREEN
3	BLUE
4	N/C
5	GND
6	GND
7	GND
8	GND
9	+5V
10	GND
11	N/C
12	SDA
13	Horizontal Sync
14	Vertical Sync
15	SCL

Parallel Port Connector: LPT1

The mainboard provides a 25-pin female centronic connector as LPT. A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.



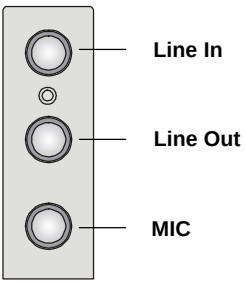
Pin Definition

PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	Paper End
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select In
18	GND	Ground
19	GND	Ground
20	GND	Ground
21	GND	Ground
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	GND	Ground

Audio Port Connectors

Line Out is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is a connector for microphones.

1/8" Stereo Audio Connectors



MSI Reminds You...

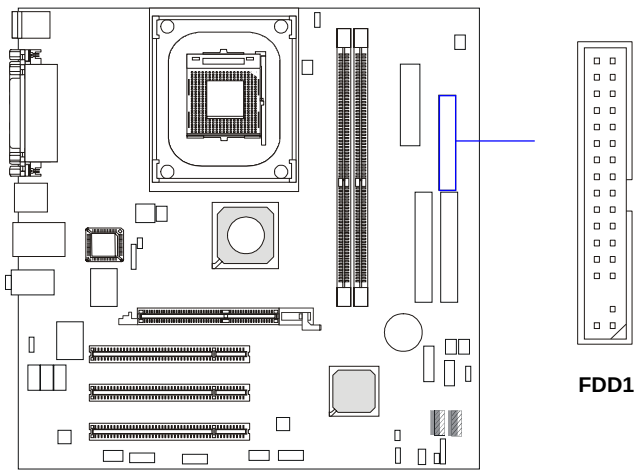
*The mainboard offers **6-channel audio operation** and can turn rear audio connectors from 2-channel to 4-/6-channel audio. For more information on **6-channel audio operation**, please refer to Appendix: Using 4- or 6-Channel Audio Function.*

Connectors

The mainboard provides connectors to connect to FDD, IDE HDD, case, LAN, USB Ports, IR module and CPU/System/Power Supply FAN.

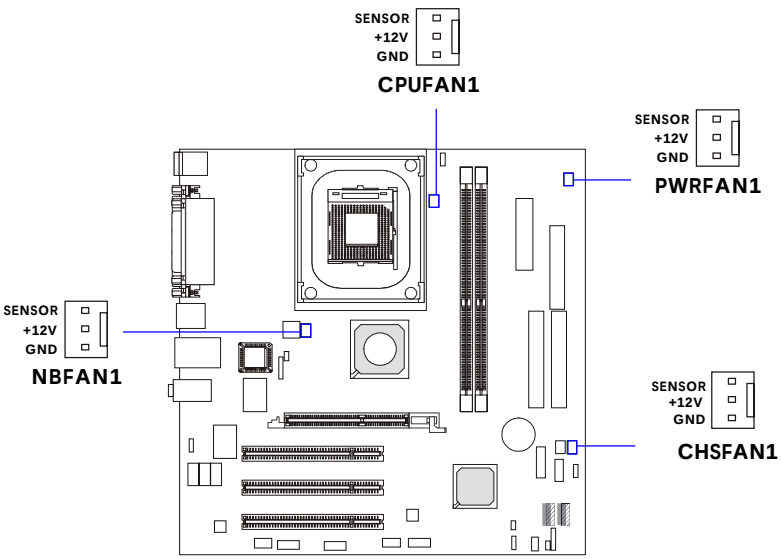
Floppy Disk Drive Connector: FDD1

The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.



Fan Power Connectors: CPUFAN1/CHSFAN1/NBFAN1/ PWRFAN1

The CPUFAN1 (processor fan), NBFAN1 (NorthBridge fan), PWRFAN1 (power fan) and CHSFAN1 (system fan) support system cooling fan with +12V. It supports three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

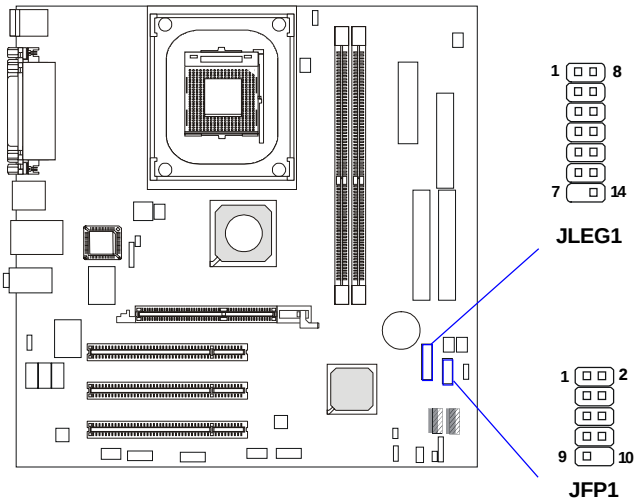


MSI Reminds You...

Always consult the vendors for proper CPU cooling fan.

Front Panel Connector: JFP1 or JLEG1

The mainboard provides one front panel connector, JFP1 or JLEG1, for electrical connection to the front panel switches and LEDs. JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.



JLEG1 Pin Definition

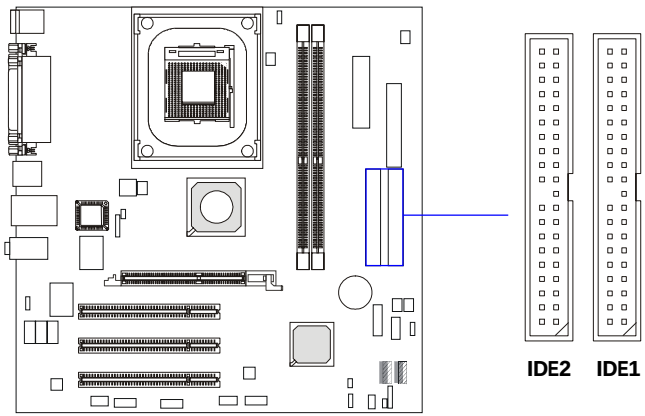
PIN	SIGNAL	PIN	SIGNAL
1	HDD+	8	HDD-
2	PLED2	9	SPEAKER
3	PLED1	10	BUZ+
4	PLED3	11	BUZ-
5	PWSW+	12	VCCSPK
6	PWSW-	13	RESET
7	NC	14	GNDR

JFP1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	HD_LED_P	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED_N	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW_N	Reset Switch low reference pull-down to GND
6	PWR_SW_P	Power Switch high reference pull-up
7	RST_SW_P	Reset Switch high reference pull-up
8	PWR_SW_N	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.

Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 66/100/133 controller that provides PIO mode 0~5, Bus Master, and Ultra DMA 66/100/133 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy and other devices.



IDE1 (Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

IDE2 (Secondary IDE Connector)

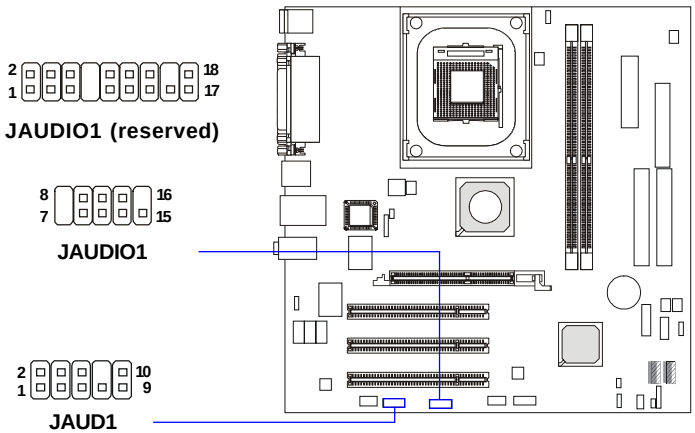
IDE2 can also connect a Master and a Slave drive.

MSI Reminds You...

If you install two hard disks on cable, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.

Front Panel Audio Connector: JAUD1 or JAUDIO1

The mainboard provides one front panel audio connector, JAUD1 or JAUDIO1, for you to connect to the front panel audio. JAUD1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

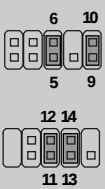


JAUDIO1 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	ALINE OUTR	2	ALINE OUTL
3	GNDALO	4	GNDALO
5	GND12V	6	GND12V
7	+12V	8	CUT
9	MIC	10	GNDMIC
11	FLINE OUTR	12	LINE NEXT R
13	FLINE OUTL	14	LINE NEXT L
15	GNDFLO	16	CUT
17	LINE-IN-R	18	LINE-IN-L

MSI Reminds You...

If you don't want to connect to the front audio header, certain pins have to be jumpered in order to have signal output directed to the rear audio ports. Otherwise, the Line-Out connector on the back panel will not function.



JAUD1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	AUD_MIC	Front panel microphone input signal
2	AUD_GND	Ground used by analog audio circuits
3	AUD_MIC_BIAS	Microphone power
4	AUD_VCC	Filtered +5V used by analog audio circuits
5	AUD_FPOUT_R	Right channel audio signal to front panel
6	AUD_RET_R	Right channel audio signal return from front panel
7	HP_ON	Reserved for future use to control headphone amplifier
8	KEY	No pin
9	AUD_FPOUT_L	Left channel audio signal to front panel
10	AUD_RET_L	Left channel audio signal return from front panel

CD-In Connector: CD_IN1

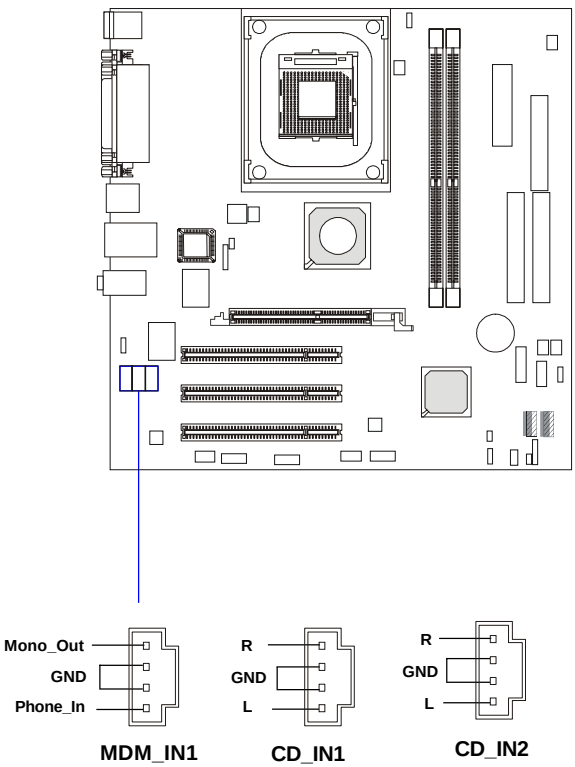
This connector is provided for CD-ROM audio.

Modem-In Connector: MDM_IN1

The connector is for modem with internal audio connector.

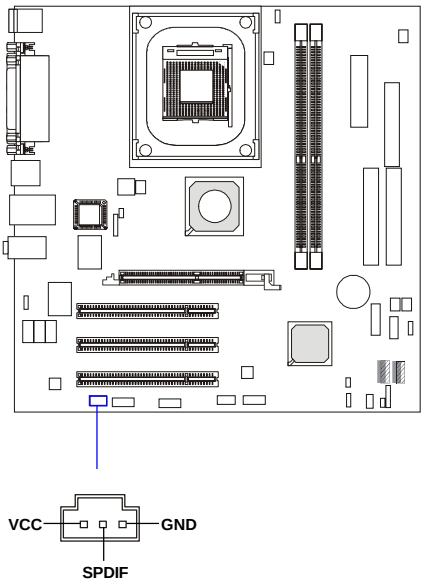
Aux Line-In Connector: CD_IN2

The connector is for DVD add-on card with Line-in connector.

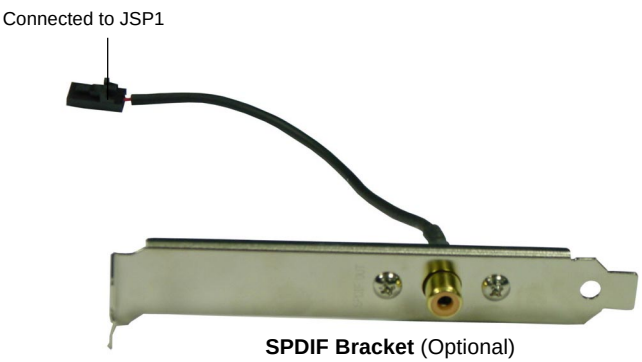


SPDIF-Out Connector: JSP1

This connector is used to connect SPDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission.



JSP1

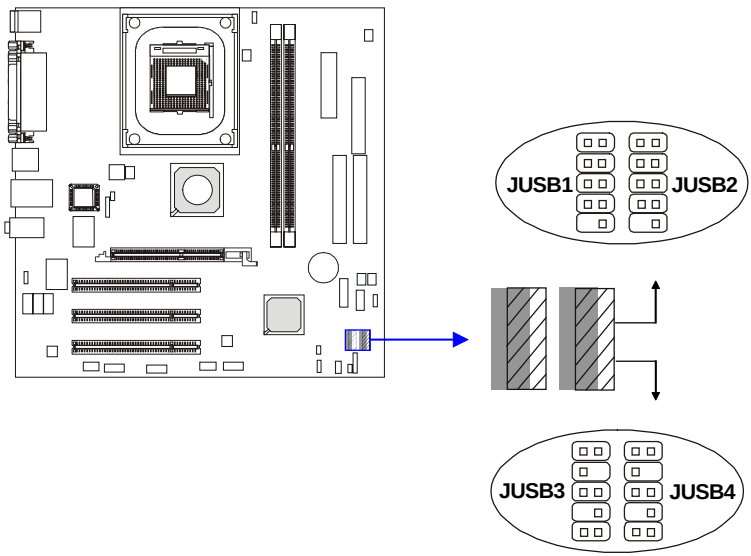


SPDIF Bracket (Optional)

Front USB Connectors: JUSB1/2 or JUSB3/4

The mainboard provides two USB 2.0 pinheaders (optional USB 2.0 Bracket available). Users can choose either JUSB1/JUSB2 or JUSB3/JUSB4 depending on the model they purchased. The difference between these front USB connectors is that JUSB1/JUSB2 are compliant with Intel® Front Panel I/O Connectivity Design Guide.

USB 2.0 technology increases data transfer rate up to a maximum throughput of 480Mbps, which is 40 times faster than USB 1.1, and is ideal for connecting high-speed USB interface peripherals such as **USB HDD**, **digital cameras**, **MP3 players**, **printers**, **modems and the like**.



JUSB3/4 Pin Definition

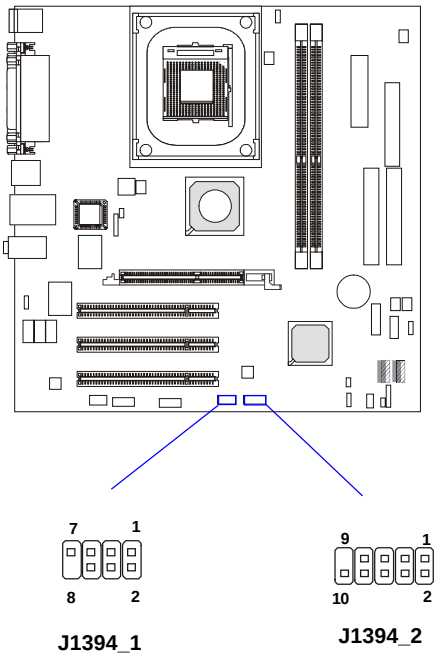
Pin	Description	Pin	Description
1	VCC1	2	GND1
3	USBON	4	GND2
5	USBOP	6	USB1P
7	GND3	8	USB1N
9	GND4	10	VCC2

JUSB1/2 Pin Definition

Pin	Description	Pin	Description
1	USBPWR	2	USBPWR
3	USBP4-	4	USBP5-
5	USBP4+	6	USBP5+
7	GND	8	GND
9	NC	10	USBOC

IEEE 1394 Connectors: J1394_1 & J1394_2

The mainboard provides two 1394 pin headers that allow you to connect optional IEEE 1394 ports.



J1394_1 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	PWR	2	GND
3	TPB-	4	TPB+
5	TPA-	6	TPA+
7	SHLD	8	Key

J1394_2 Pin Definition

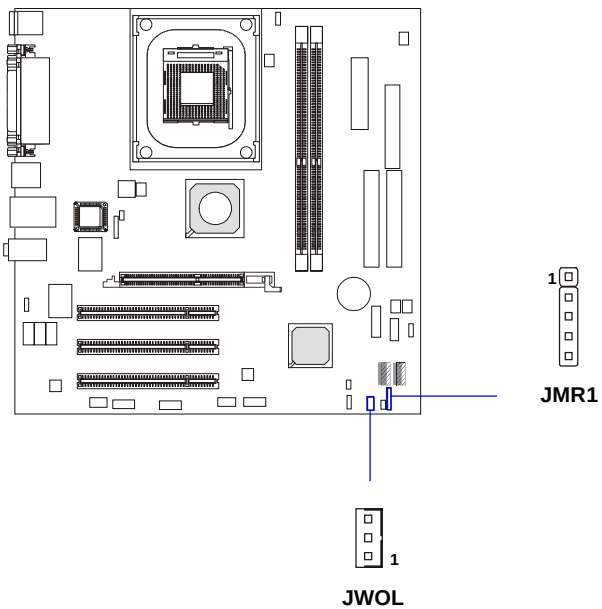
PIN	SIGNAL	PIN	SIGNAL
1	TPA+	2	TPA-
3	Ground	4	Ground
5	TPB+	6	TPB-
7	Cable power	8	Cable power
9	Key (no pin)	10	Ground

Wake On LAN Connector: JWOL

This connector allows you to connect to a LAN card with Wake On LAN function. You can wake up the computer via remote control through a local area network.

Wake On Ring Connector: JMR1

This connector allows you to connect to a modem card with Wake On Ring function. The connector will power up the system when a signal is received through the modem card.



JMR1 Pin Definition

Pin	Signal
1	NC
2	GND
3	MDM_WAKEUP
4	NC
5	5VSB

JWOL Pin Definition

Pin	Signal
1	5VSB
2	GND
3	MP-WAKEUP

Power Saving Switch Connector: JSMI1

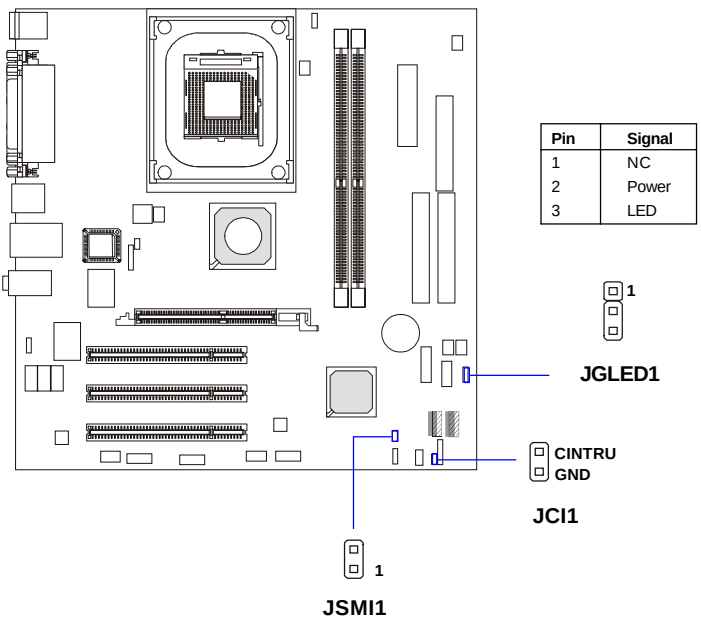
Attach a power saving switch to this connector. Pressing the switch once will have the system enter the sleep state. Press any key to wake up the system.

Power Saving LED Connector: JGLED1

This allows you to connect to a power saving LED. The LED will be lit when the system enters the suspend mode.

Chassis Intrusion Switch Connector: JCI1

This connector is connected to a 2-pin chassis switch. If the chassis is opened, the switch will be short connected. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record. JCI1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.



IrDA Infrared Module Header: IR1

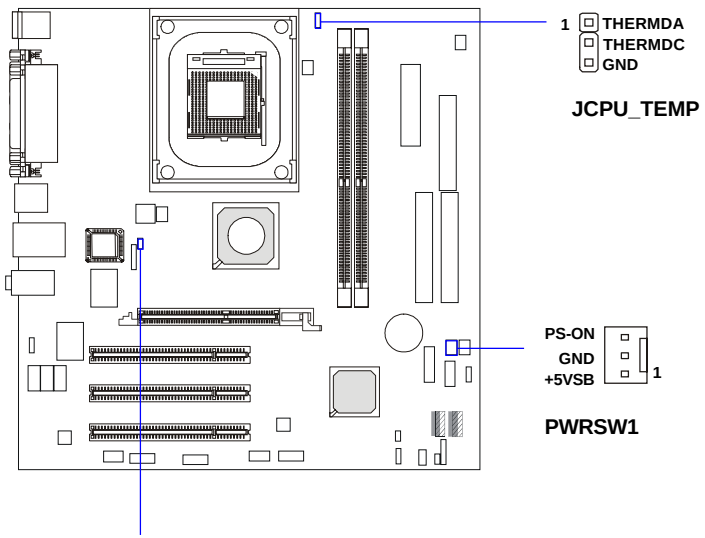
The connector allows you to connect to IrDA Infrared module. You must configure the setting through the BIOS setup to use the IR function. IR1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

Independent Power Switch Connector: PWRSW1

The connector is connected to an independent power switch on the case. Touch the power switch's touch pad will turn on/off the computer.

CPU-Temp Control Connector: JCPU_TEMP

The connector is used to control the CPU temperature.



IR1 Pin Definition

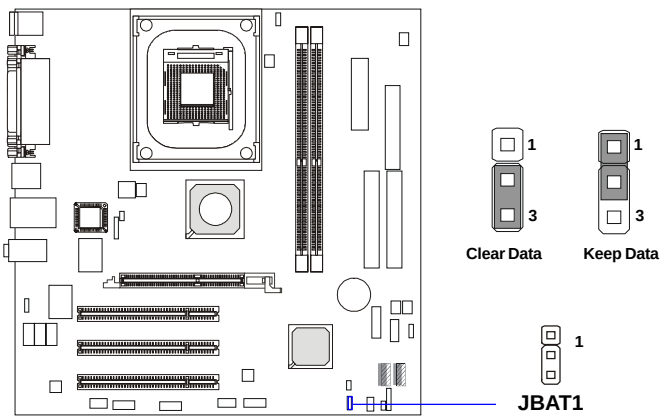
PIN	SIGNAL
1	VCC
2	NC
3	IRRX
4	GND
5	IRTX

Jumpers

The motherboard provides the following jumpers for you to set the computer's function. This section will explain how to change your motherboard's function through the use of jumpers.

Clear CMOS Jumper: JBAT1

There is a CMOS RAM on board that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, use the JBAT1 (Clear CMOS Jumper) to clear data. Follow the instructions below to clear the data:



MSI Reminds You...

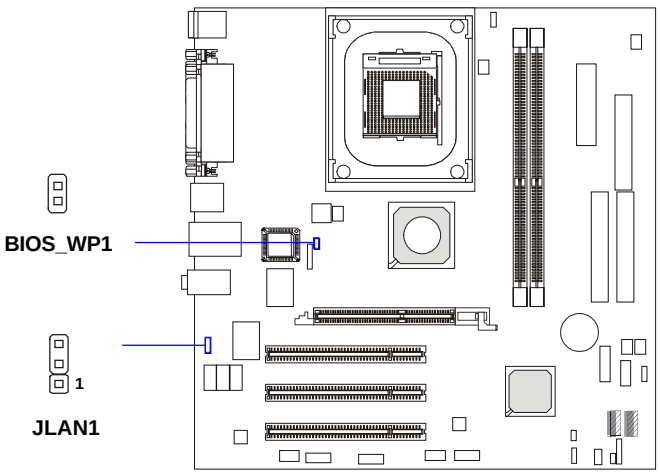
You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

LAN Enable/Disable Jumper: JLAN1

The jumper is used to enable or disable the onboard LAN function. The jumper is available only when LAN is integrated on the board.

BIOS Flash Jumper: BIOS_WP1

This jumper is used to lock or unlock the boot block area on BIOS. When unlocked, the BIOS boot block area can be updated. When locked, the BIOS boot block area cannot be updated.



BIOS Flash Locked

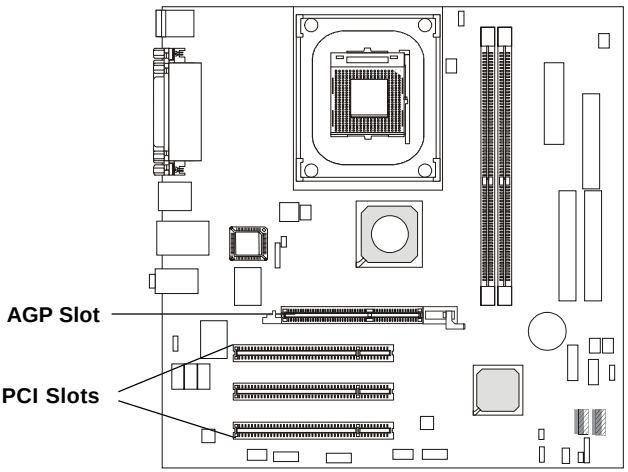
BIOS Flash Unlocked

Enable LAN

Disable LAN

Slots

The motherboard provides one AGP slot and three 32-bit PCI bus slots.



AGP (Accelerated Graphics Port) Slot

The AGP slot allows you to insert the AGP graphics card. AGP is an interface specification designed for the throughput demands of 3D graphics. It introduces a 66MHz, 32-bit channel for the graphics controller to directly access main memory. The mainboard supports 4x (1.07Gbps) and 8x (2.1Gbps) 1.5V AGP cards.

PCI (Peripheral Component Interconnect) Slots

The PCI slots allow you to insert the expansion cards to meet your needs. When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to make any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

PCI Interrupt Request Routing

The IRQ, acronym of interrupt request line and pronounced I-R-Q, are hardware lines over which devices can send interrupt signals to the microprocessor. The PCI IRQ pins are typically connected to the PCI bus INT A# ~ INT D# pins as follows:

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT B#	INT C#	INT D#	INT A#
PCI Slot 2	INT C#	INT D#	INT A#	INT B#
PCI Slot 3	INT D#	INT A#	INT B#	INT C#

BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.
You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> key to enter Setup.

```
Press DEL to enter SETUP
```

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General help, only for Status Page Setup Menu and Option Page Setup Menu
<F5>	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
<F6>	Load the default CMOS value from Fail-Safe default table, only for Option Page Setup Menu
<F7>	Load Optimized defaults
<F10>	Save all the CMOS changes and exit

Getting Help

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the control keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu containing additional options can be launched from this field. You can use control keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press <Esc >.

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

MSI Reminds You...

The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.

The Main Menu

Once you enter Phoenix-Award® BIOS CMOS Setup Utility, the Main Menu (Figure 1) will appear on the screen. The Main Menu allows you to select from twelve setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

Standard CMOS Features
Use this menu for basic system configurations, such as time, date etc.

Advanced BIOS Features
Use this menu to setup the items of special enhanced features.

Advanced Chipset Features
Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

Power Management Setup
Use this menu to specify your settings for power management.

PnP/PCI Configurations
This entry appears if your system supports PnP/PCI.

PC Health Status
This entry shows your PC health status.

Frequency/Voltage Control
Use this menu to specify your settings for frequency/voltage control.

Load Fail-Safe Defaults
Use this menu to load the BIOS values for the best system performance, but the system stability may be affected.

Load Optimized Defaults
Use this menu to load factory default settings into the BIOS for stable system performance operations.

Set Supervisor Password
Use this menu to set Supervisor Password.

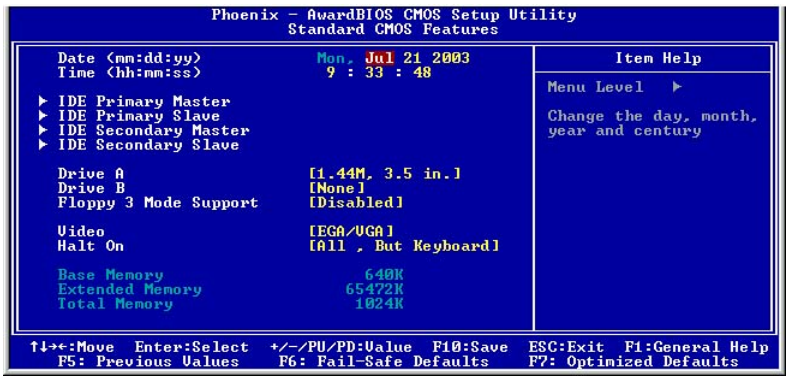
Set User Password
Use this menu to set User Password.

Save & Exit Setup
Save changes to CMOS and exit setup.

Exit Without Saving
Abandon all changes and exit setup.

Standard CMOS Features

The items in Standard CMOS Features Menu are divided into 11 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.


Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features
Date (mm:dd:yy) Mon, Jul 21 2003
Time (hh:mm:ss) 9 : 33 : 48
IDE Primary Master
IDE Primary Slave
IDE Secondary Master
IDE Secondary Slave
Drive A [1.44M, 3.5 in.]
Drive B [None]
Floppy 3 Mode Support [Disabled]
Video [EGA/VGA]
Halt On [All , But Keyboard]
Base Memory 640K
Extended Memory 65472K
Total Memory 1024K
Item Help
Menu Level ▶
Change the day, month, year and century
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Date

This allows you to set the system to the date that you want (usually the current date). The format is <day><month> <date> <year>.

day	Day of the week, from Sun to Sat, determined by BIOS. Read-only.
month	The month from Jan. through Dec.
date	The date from 1 to 31 can be keyed by numeric function keys.
year	The year can be adjusted by users.

Time

This allows you to set the system time that you want (usually the current time). The time format is <hour> <minute> <second>.

IDE Primary/Secondary Master/Slave

Press PgUp/<+> or PgDn/<-> to select *Manual*, *None* or *Auto* type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use *Manual* to

define your own drive type manually.

If you select *Manual*, related information is asked to be entered to the following items. Enter the information directly from the keyboard. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

Access Mode	The settings are CHS, LBA, Large, Auto.
Capacity	The formatted size of the storage device.
Cylinder	Number of cylinders.
Head	Number of heads.
Precomp	Write precompensation.
Landing Zone	Cylinder location of the landing zone.
Sector	Number of sectors.

Drive A:/B:
This item allows you to set the type of floppy drives installed. Available options: *None*, *360K 5.25*, *1.2 MB 5.25*, *720 KB 3.5*, *1.44 MB 3.5* and *2.88 MB 3.5*.

Floppy 3 Mode Support
When Enabled, the BIOS supports a type of 3.5-in diskette drive that can read 720-KB, 1.2-MB, and 1.44-MB diskettes.

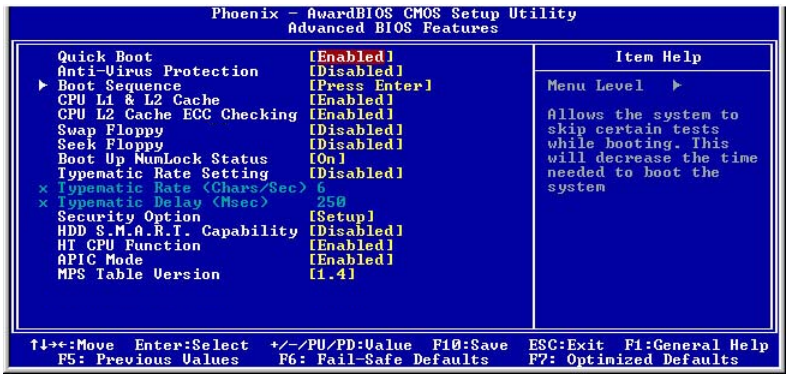
Video
The setting controls the type of video adapter used for the primary monitor of the system. Available options: *EGA/VGA* , *CGA 40*, *CGA 80*, *MONO*.

Halt On
The setting determines whether the system will stop if an error is detected at boot. Available options are:

All Errors	The system stops when any error is detected.
No Errors	The system doesn't stop for any detected error.
All, But Keyboard	The system doesn't stop for a keyboard error.
All, But Diskette	The system doesn't stop for a disk error.
All, But Disk/Key	The system doesn't stop for either a disk or a keyboard error.

Base/Extended/Total Memory
The three items show the memory status of your system (read only).

Advanced BIOS Features


Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features
Quick Boot [Enabled]
Anti-Virus Protection [Disabled]
Boot Sequence [Press Enter]
CPU L1 & L2 Cache [Enabled]
CPU L2 Cache ECC Checking [Enabled]
Swap Floppy [Disabled]
Seek Floppy [Disabled]
Boot Up NumLock Status [On]
Typematic Rate Setting [Disabled]
Typematic Rate (Chars/Sec) 6
Typematic Delay (Msec) 250
Security Option [Setup]
HDD S.M.A.R.T. Capability [Disabled]
HT CPU Function [Enabled]
APIC Mode [Enabled]
MPS Table Version [1.4]
Item Help
Menu Level ▶
Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Quick Boot

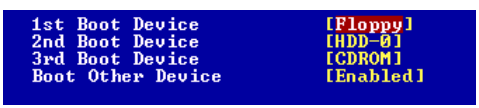
Setting the item to *Enabled* allows the system to boot within 5 seconds since it will skip some check items. Available options: *Enabled*, *Disabled*.

Anti-Virus Protection

The item is to set the Virus Warning feature for IDE Hard Disk boot sector protection. If the function is enabled and any attempt to write data into this area is made, BIOS will display a warning message on screen and beep. Settings: *Disabled* and *Enabled*.

Boot Sequence

Press <Enter> and the following sub-menu appears.



1st/2nd/3rd Boot Device

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system.

Boot Other Device

Setting the option to *Enabled* allows the system to try to boot from other devices if the system fails to boot from the 1st/2nd/3rd boot device.

Settings: *Enabled*, *Disabled*.

CPU L1 & L2 Cache
The item allows you to turn on or off CPU's internal (L1) and external (L2) cache. Settings: *Enabled* and *Disabled*.

CPU L2 Cache ECC Checking
This setting allows you to enable or disable the ECC (Error-Correcting Code) feature for error detection and correction when data passes through L2 cache memory. Setting options: *Enabled*, *Disabled*.

SwapFloppy
Setting to *Enabled* will swap floppy drives A: and B:.

Seek Floppy
Setting to *Enabled* will make BIOS seek floppy drive A: before booting the system. Settings: *Disabled*, *Enabled*.

Boot Up NumLock Status
This setting is to set the Num Lock status when the system is powered on. Setting to *On* will turn on the Num Lock key when the system is powered on. Setting to *Off* will allow users to use the arrow keys on the numeric keypad. Setting options: *On*, *Off*.

Typematic Rate Setting
This item is used to enable or disable the typematic rate setting including Typematic Rate & Typematic Delay.

Typematic Rate (Chars/Sec)
After *Typematic Rate Setting* is enabled, this item allows you to set the rate (characters/second) at which the keys are accelerated. Settings: *6*, *8*, *10*, *12*, *15*, *20*, *24* and *30*.

Typematic Delay (Msec)
This item allows you to select the delay between when the key was first pressed and when the acceleration begins. Settings: *250*, *500*, *750* and *1000*.

Security Option
This specifies the type of BIOS password protection that is implemented. Settings are described below:

Option	Description
Setup	The password prompt appears only when end users try to run Setup.
System	A password prompt appears every time when the computer is powered on or when end users try to run Setup.

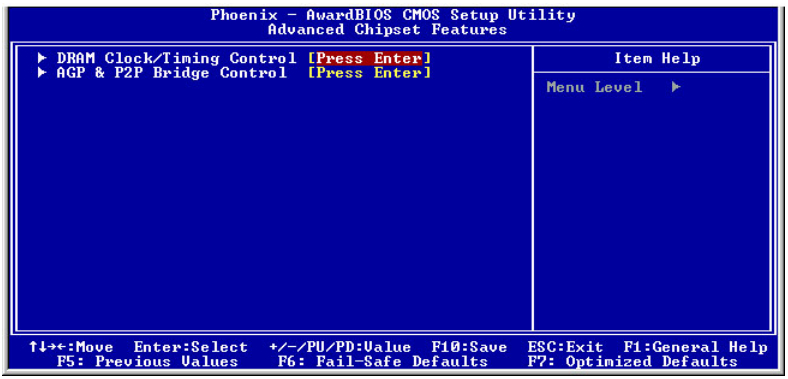
HDD S.M.A.R.T. Capability
This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline. Settings: *Enabled* and *Disabled*.

HT CPU Function
This field is used to enable or disable the Intel Hyper Threading CPU function. Setting to Enabled will increase the system performance. Settings: *Enabled*, *Disabled*. Please disable this item if your operating system doesn't support HT Function, or the unreliability and instability may occur.

APIC Mode
This field is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance with PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQ resources for the system. Settings: *Enabled* and *Disabled*.

MPS Table Version
This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system. Settings: *1.4*, *1.1*.

Advanced Chipset Features

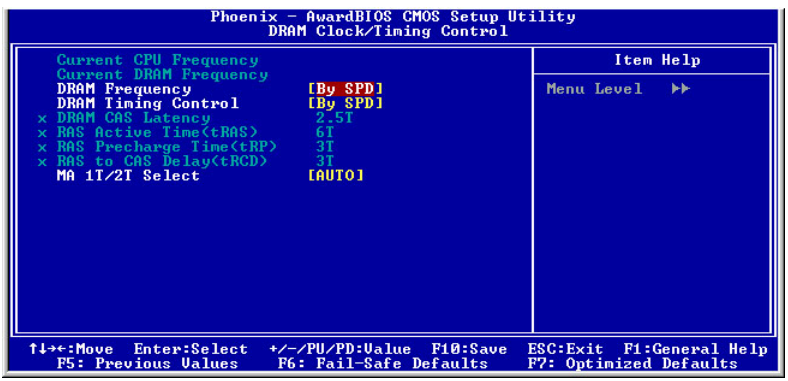

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features
▶ DRAM Clock/Timing Control [Press Enter]
▶ AGP & P2P Bridge Control [Press Enter]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

MSI Reminds You...

Change these settings only if you are familiar with the chipset.

DRAM Clock/Drive Control

Press <Enter> and the following sub-menu appears.


Phoenix - AwardBIOS CMOS Setup Utility
DRAM Clock/Timing Control
Current CPU Frequency
Current DRAM Frequency
DRAM Frequency [By SPD]
DRAM Timing Control [By SPD]
x DRAM CAS Latency 2.5T
x RAS Active Time(tRAS) 6T
x RAS Precharge Time(tRP) 3T
x RAS to CAS Delay(tRCD) 3T
MA 1T/2T Select [AUTO]
Item Help
Menu Level ▶▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Current CPU/DRAM Frequency

It shows the current CPU/DRAM frequency. (read only)

DRAM Frequency
This item is used to configure the clock frequency of the installed DRAM. Settings: *By SPD, 100MHz, 133MHz, 166MHz, 200MHz.*

DRAM Timing Control
Selects whether DRAM timing is controlled by the SPD (Serial Presence Detect) EEPROM on the DRAM module. Setting to *By SPD* enables DRAM timings to be determined by BIOS based on the configurations on the SPD. Selecting *Manual* allows users to configure the DRAM timings manually.

DRAM CAS Latency
This controls the timing delay (in clock cycles) before SDRAM starts a read command after receiving it. Settings are: *2T, 2.5T, 3T.* 2T increases the system performance while 3T provides the most stable performance.

RAS Active Time (tRAS)
This setting controls the number of clock cycles for DRAM to be allowed to precharge from the active state. Settings: *4,T, 5T, 6T, 7T, 8T, 9T.*

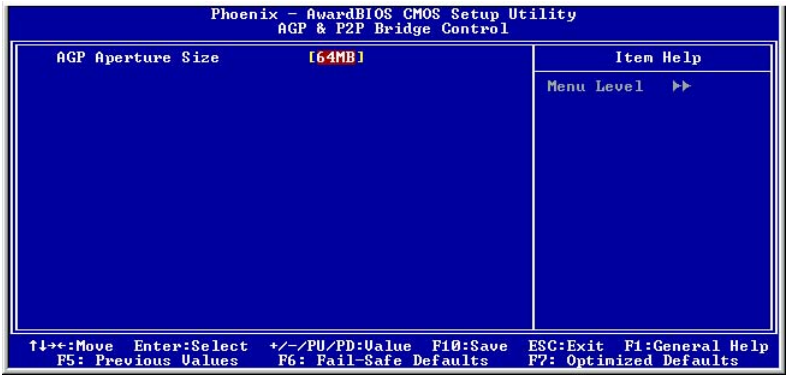
RAS Precharge Time (tRP)
This item controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refresh may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Available settings: *2T, 3T, 4T, 5T.*

RAS to CAS Delay (tRCD)
When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance. Setting options: *2T, 3T, 4T, 5T.*

MA 1T/2T Select
This setting controls the SDRAM command rate. Selecting *1T* allows SDRAM signal controller to run at 1T (T=clock cycles) rate. Selecting *2T* makes SDRAM signal controller run at 2T rate. *1T* is faster than *2T*. Setting options: *Auto, 1T, 2T.*

AGP & P2P Bridge Control

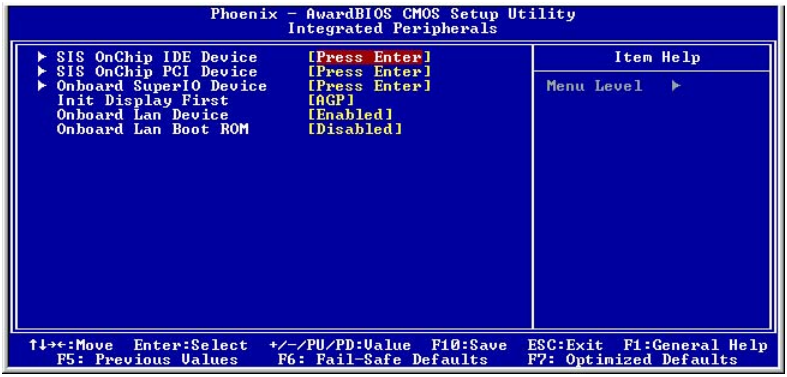
Press <Enter> and the following sub-menu appears.


Phoenix - AwardBIOS CMOS Setup Utility
AGP & P2P Bridge Control
AGP Aperture Size [64MB]
Item Help
Menu Level ▶▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

AGP Aperture Size

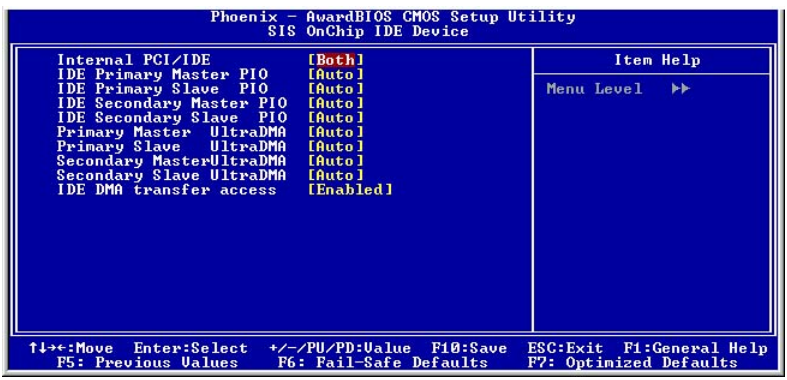
This setting controls just how much system RAM can be allocated to AGP for video purposes. The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The option allows the selection of an aperture size of *4MB, 8MB, 16MB, 32MB, 64MB, 128MB, 256MB, 512MB and 1G.*

Integrated Peripherals


Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals
SIS OnChip IDE Device [Press Enter]
SIS OnChip PCI Device [Press Enter]
Onboard SuperIO Device [Press Enter]
Init Display First [AGP]
Onboard Lan Device [Enabled]
Onboard Lan Boot ROM [Disabled]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

SIS OnChip IDE Device

Press <Enter> to enter the sub-menu and the following screen appears:


Phoenix - AwardBIOS CMOS Setup Utility
SIS OnChip IDE Device
Internal PCI/IDE [Both]
IDE Primary Master PIO [Auto]
IDE Primary Slave PIO [Auto]
IDE Secondary Master PIO [Auto]
IDE Secondary Slave PIO [Auto]
Primary Master UltraDMA [Auto]
Primary Slave UltraDMA [Auto]
Secondary MasterUltraDMA [Auto]
Secondary Slave UltraDMA [Auto]
IDE DMA transfer access [Enabled]
Item Help
Menu Level ▶▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Internal PCI/IDE

This setting enables or disables the internal primary and secondary PCI & IDE controllers. Setting options: *Disabled*, *Primary*, *Secondary*, *Both*.

IDE Primary/Secondary Master/Slave PIO

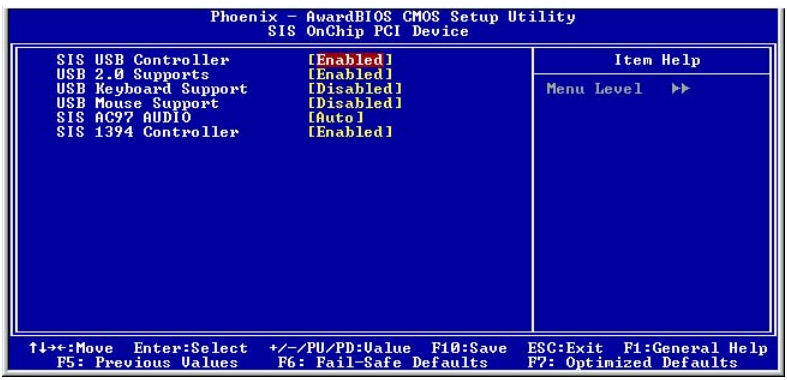
The four IDE PIO (Programmed Input/Output) fields let you set a PIO

mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device. The settings are: *Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4*.

Primary/Secondary Master/Slave UltraDMA
Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, Ultra DMA/66 and Ultra DMA/100 select Auto to enable BIOS support. The settings are: *Auto, Disabled*.

IDE DMA Transfer Access
This item allows users to enable or disable the DMA transfer function of the IDE hard drive. The settings are: *Enabled, Disabled*.

SIS OnChip PCI Device
Press <Enter> to enter the sub-menu and the following screen appears:


Phoenix - AwardBIOS CMOS Setup Utility
SIS OnChip PCI Device
SIS USB Controller [Enabled]
USB 2.0 Supports [Enabled]
USB Keyboard Support [Disabled]
USB Mouse Support [Disabled]
SIS AC97 AUDIO [Auto]
SIS 1394 Controller [Enabled]
Item Help
Menu Level ▶▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

SIS USB Controller
This setting is used to enable/disable the onboard USB controller. Setting options: *Disabled, Enabled*.

USB 2.0 Supports

Set to *Enabled* if you need to use any USB 2.0 device in the operating system that does not support or have any USB 2.0 driver installed, such as DOS and SCO Unix. Setting options: *Disabled*, *Enabled*.

USB Mouse/Keyboard Support

Set to *Enabled* if your need to use an USB mouse/keyboard in the operating system that does not support or have any USB driver installed, such as DOS and SCO Unix.

SIS AC97 AUDIO

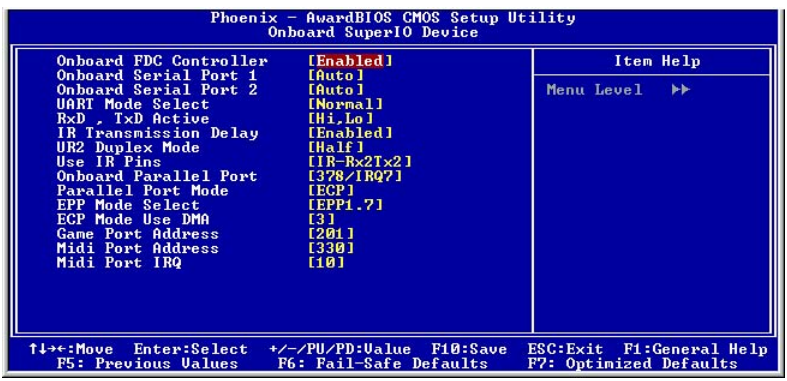
Auto allows the motherboard's BIOS to detect whether you're using any audio device. If so, the onboard audio controller will be enabled. If not, the onboard audio controller will be disabled. If you want to use different controller cards to connect audio connectors, set the field to *Disabled*. Setting options: *Disabled*, *Auto*.

SIS 1394 Controller

This item allows you to enable/disable the onboard IEEE1394 controller. Setting options: *Enabled* and *Disabled*.

Onboard Super IO Device

Press <Enter> to enter the sub-menu and the following screen appears:


Phoenix - AwardBIOS CMOS Setup Utility
Onboard SuperIO Device
Onboard FDC Controller [Enabled]
Onboard Serial Port 1 [Auto]
Onboard Serial Port 2 [Auto]
UART Mode Select [Normal]
RxD , TxD Active [Hi,Lo]
IR Transmission Delay [Enabled]
UR2 Duplex Mode [Half]
Use IR Pins [IR-Rx2Tx2]
Onboard Parallel Port [378/IRQ7]
Parallel Port Mode [ECP]
EPP Mode Select [EPP1.7]
ECP Mode Use DMA [3]
Game Port Address [201]
Midi Port Address [330]
Midi Port IRQ [10]
Item Help
Menu Level ▸▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Onboard FDC Controller
Select Enabled if your system has a floppy disk controller (FDD) installed on the system board and you wish to use it. If you install add-on FDC or the system has no floppy drive, select Disabled in this field. The settings are: *Enabled* and *Disabled*.

Onboard Serial Port 1/Port 2
Select an address and corresponding interrupt for the first and second serial ports. The settings are: *3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto*.

UART Mode Select
This setting allows you to specify the operation mode for serial port 2. Setting options: *IrDA, ASKIR, Normal*.

Normal	RS-232C Serial Port
IrDA	IrDA-compliant Serial Infrared Port
ASKIR	Amplitude Shift Keyed Infrared Port

RxD, TxD Active
This setting controls the receiving and transmitting speed of the IR peripheral in use. Setting options: *Hi/Hi, Hi/Lo, Lo/Hi, Lo/Lo*.

IR Transmission Delay
This setting determines whether the IR transmission rate will be delayed while converting to receiving mode. Setting options: *Disabled, Enabled*.

UR2 Duplex Mode
This setting controls the operating mode of IR transmission/reception. Setting options: *Full, Half*. Under Full Duplex mode, synchronous, bi-directional transmission/reception is allowed. Under Half Duplex mode, only asynchronous, bi-directional transmission/reception is allowed.

Use IR Pins
Please consult your IR peripheral documentation to select the correct setting of the TxD and RxD signals. Setting options: *RxD2/TxD2, IR-Rx2Tx2*.

Onboard Parallel Port

There is a built-in parallel port on the on-board Super I/O chipset that provides Standard, ECP, and EPP features. It has the following options:

Disabled	
3BC/IRQ7	Line Printer port 0
278/IRQ5	Line Printer port 2
378/IRQ7	Line Printer port 1

Parallel Port Mode

SPP : Standard Parallel Port
EPP : Enhanced Parallel Port
ECP : Extended Capability Port
ECP + EPP: Extended Capability Port + Enhanced Parallel Port

SPP/EPP/ECP/ECP+EPP

To operate the onboard parallel port as Standard Parallel Port only, choose "SPP." To operate the onboard parallel port in the EPP mode simultaneously, choose "EPP." By choosing "ECP", the onboard parallel port will operate in ECP mode only. Choosing "ECP + EPP" will allow the onboard parallel port to support both the ECP and EPP modes simultaneously.

EPP Mode Select

The onboard parallel port is EPP Spec. compliant, so after the user chooses the onboard parallel port with the EPP function, the following message will be displayed on the screen: "EPP Mode Select." At this time either *EPP 1.7* spec or *EPP 1.9* spec can be chosen.

ECP Mode Use DMA

The ECP mode has to use the DMA channel, so choose the onboard parallel port with the ECP feature. After selecting it, the following message will appear: "ECP Mode Use DMA." At this time, the user can choose between DMA channel *3* or *1*.

Game Port Address/Midi Port Address

This setting assigns certain addresses for the game port and midi port.
Settings for game port address are: *Disabled, 201* and *209.*
Settings for Midi port address are: *Disabled, 330, 300* and *290.*

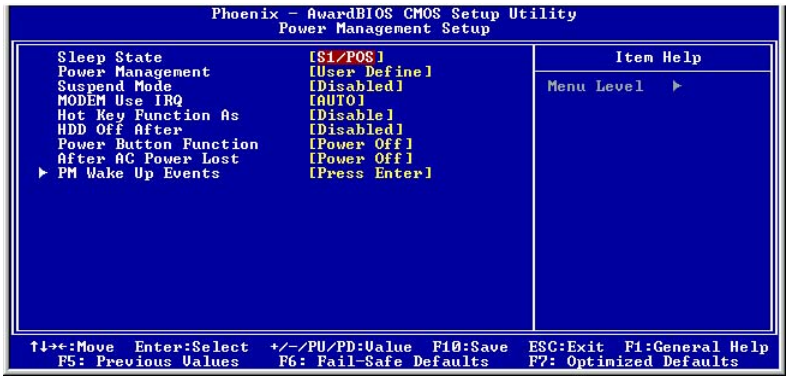
Midi Port IRQ
This setting assigns an IRQ for the midi port. Settings are: *5, 10*.

Init Display First
This item specifies which VGA card is your primary graphics adapter. Settings: *PCI Slot* and *AGP*.

Onboard Lan Device
Select *Enabled* to activate the onboard LAN controller. Setting options: *Enabled, Disabled*.

Onboard Lan Boot ROM
This setting determines whether or not to activate the boot ROM of the onboard LAN chip. Setting options: *Enabled, Disabled*.

Power Management Setup


Phoenix – AwardBIOS CMOS Setup Utility
Power Management Setup
Sleep State [S1/POS]
Power Management [User Define]
Suspend Mode [Disabled]
MODEM Use IRQ [AUTO]
Hot Key Function As [Disable]
HDD Off After [Disabled]
Power Button Function [Power Off]
After AC Power Lost [Power Off]
PM Wake Up Events [Press Enter]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

MSI Reminds You...

S3-related functions described in this section are available only when your BIOS supports S3 sleep mode.

Sleep State

This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 98SE, Windows ME and Windows 2000, you can choose to enter the Standby mode in S1(POS) or S3(STR) fashion through the setting of this field. Options are:

S1/POS The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system context.

S3/STR The S3 sleep mode is a lower power state where the in formation of system configuration and open applications/ files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a “wake up” event occurs.

Power Management

This item is used to select the degree (or type) of power saving and is related to *Suspend Mode*. There are three options for power management:

Min Saving	Minimum Power Management. Suspend Mode=1 Hour
Max Saving	Maximum Power Management. Suspend Mode=1 Min
User Define	Allows end users to configure each mode separately.

Suspend Mode
If system activity is not detected for the length of time specified in this field, all devices except CPU will be shut off. Settings: *Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 10 Min, 20 Min, 30 Min, 40 Min, 1 Hour.*

MODEM Use IRQ
This determines the IRQ in which the MODEM can use. Activity of the selected IRQ always awakens the system. Settings: *3, 4, 5, 7, 9, 10, 11, NA.*.

Hot Key Function As
This setting specifies the function of the preset hot key (Ctrl+Alt+Backspace). Setting options: *Disable*, *Power Off*, *Suspend*.

HDD Off After
After the selected period of drive inactivity, the hard disk drive powers down while all other devices remain active. Selecting Suspend tells the drive to power down immediately.

Power Button Function
This feature sets the function of the power button. Settings are:

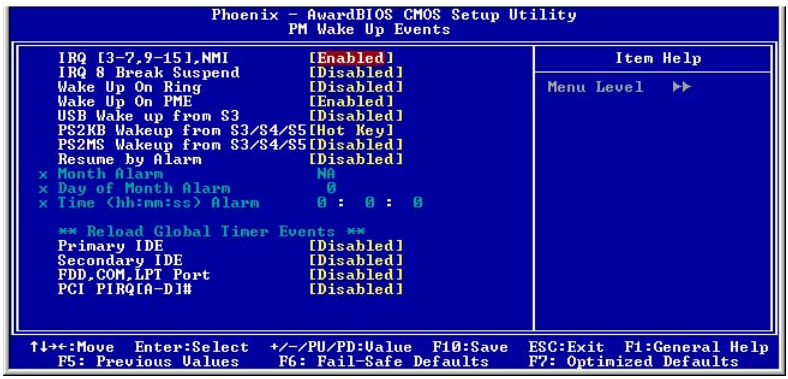
Power Off	The power button functions as normal power off button.
Suspend	When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

After AC Power Lost
This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

Power Off	Leaves the computer in the power off state.
Power On	Leaves the computer in the power on state.
Last State	Restores the system to the previous status before power failure or interrupt occurred.

PM Wake Up Events

Press <Enter> and the following sub-menu appears.


Phoenix - AwardBIOS CMOS Setup Utility
PM Wake Up Events
IRQ [3-7,9-15],NMI [Enabled]
IRQ 8 Break Suspend [Disabled]
Wake Up On Ring [Disabled]
Wake Up On PME [Enabled]
USB Wake up from S3 [Disabled]
PS2KB Wakeup from S3/S4/S5 [Hot Key]
PS2MS Wakeup from S3/S4/S5 [Disabled]
Resume by Alarm [Disabled]
x Month Alarm NA
x Day of Month Alarm 0
x Time (hh:mm:ss) Alarm 0 : 0 : 0
** Reload Global Timer Events **
Primary IDE [Disabled]
Secondary IDE [Disabled]
FDD,COM,LPT Port [Disabled]
PCI PIRQ[A-D]# [Disabled]
Item Help
Menu Level ▸▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

IRQ [3-7, 9-15], NMI & IRQ 8 Break Suspend

This setting enables/disables the monitoring of the specified IRQ line. If set to *Enabled*, the activity of the specified IRQ line will prevent the system from entering power saving modes or awaken it from power saving modes. Setting options: *Disabled*, *Enabled.*

Wake Up On Ring

These fields specify whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or component is detected. Options: *Enabled, Disabled.*

Wake Up On PME

When set to *Enabled*, the feature allows your system to be awakened from the power saving modes through any event on PME (Power Management Event). Settings are: *Enabled* and *Disabled*.

USB Wake up from S3

This item allows the activity of the USB device to wake up the system from S3 (Suspend to RAM) state. Settings are: *Enabled* and *Disabled*.

PS2KB Wake Up from S3/S4/S5

This setting allows you to enter "Hot Key" (max. 8 numbers) to wake up the system from S3/S4/S5 state. Settings are: *Disable, Ctrl+F1~Ctrl+F12,*

Power, Wake, Any Key.

PS2MS Wake Up from S3/S4/S5
This setting allows the activity of the mouse to wake up the system from S3/S4/S5 state. Settings are: *Enabled* and *Disabled*.

MSI Reminds You...
1. You need to install a modem card supporting power on function for "Wake Up On Ring" function.

2. If you have enabled the"PS2MS Wake Up from S3/S4/S5" function, you need to click the mouse to power on the system.

Resume By Alarm
The field is used to enable or disable the feature of booting up the system on a scheduled time/date.

Date(of Month) Alarm
The field specifies the date for *Resume By RTC Alarm*. Settings: 0~31.

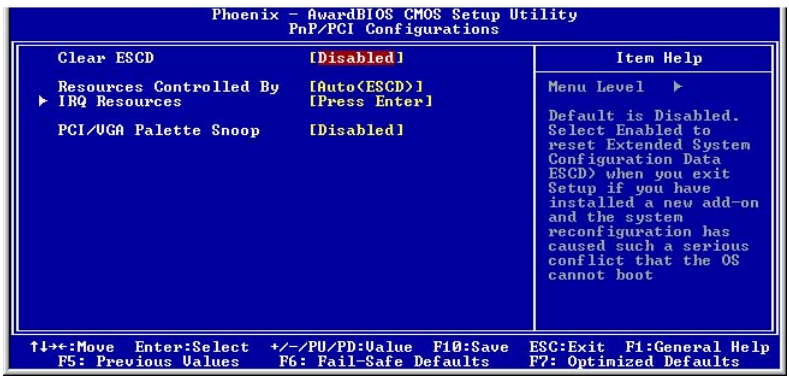
Time(hh:mm:ss) Alarm
The field specifies the time for *Resume By RTC Alarm*. Format is <hour> <minute><second>.

MSI Reminds You...
If you have changed this setting, you must let the system boot up until it enters the operating system, before this function will work.

****Reload Global Timer Events****
Primary/Secondary IDE, FDD, COM, LPT Port, PCI PIRQ [A-D] #
The global timer is the hardware timer that counts down to the power saving modes. If the monitoring of the listed hardware peripherals or components is enabled, the activity of the specified peripherals or components will awaken the system or reload the original count of global timer when they are accessed.

PNP/PCI Configurations

This section describes configuring the PCI bus system and PnP (Plug & Play) feature. PCI, or **P**eripheral **C**omponent **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.


Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Clear ESCD [Disabled]
Resources Controlled By [Auto(ESCD)]
IRQ Resources [Press Enter]
PCI/VGA Palette Snoop [Disabled]
Item Help
Menu Level
Default is Disabled. Select Enabled to reset Extended System Configuration Data ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Clear ESCD

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system can not boot. The settings are: *Enabled* and *Disabled*.

Resource Controlled By

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 95/98. If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a "➢"). The settings are: *Auto (ESCD), Manual*.

IRQ Resources

The items are adjustable only when *Resources Controlled By* is set to *Manual*.

Press <Enter> and you will enter the sub-menu of the items. IRQ Resources list IRQ 3/4/5/7/9/10/11/12/14/15 for users to set each IRQ a type depending on the type of device using the IRQ. Settings are:

PCI Device	For Plug & Play compatible devices designed for PCI bus architecture.
Reserved	The IRQ will be reserved for further request.

PCI/VGA Palette Snoop

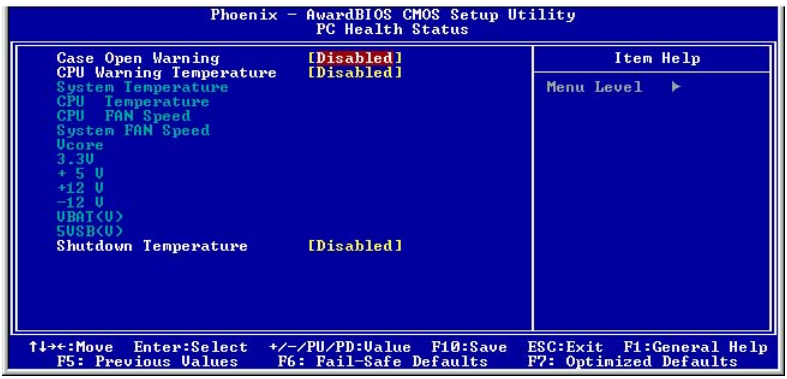
When set to *Enabled*, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example, if there are two VGA devices in the computer (one PCI and one ISA) and the:

VGA Palette Snoop Bit Setting	**Action**
Disabled	Data read or written by the CPU is only directed to the PCI VGA device's palette registers.
Enabled	Data read or written by the CPU is directed to both the PCI VGA device's palette registers and the ISA VGA device's palette registers, permitting the palette registers of both VGA devices to be identical.

The setting must be set to *Enabled* if any ISA bus adapter in the system requires VGA palette snooping.

PC Health Status

This section shows the status of your CPU, fan, overall system status, etc. Monitor function is available only if there is hardware monitoring mechanism onboard.



Case Open Warning

The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to *Reset*. The setting of the field will automatically return to *Enabled* later. Setting options: *Enabled*, *Reset*, *Disabled*.

CPU Warning Temperature

This item is used to specify a thermal limit for CPU. If CPU temperature reaches the specified limit, the system will issue a warning which allows you to prevent the CPU overheat problem. Settings: *Disabled*, *50°C/122°F*, *53°C/127°F*, *56°C/133°F*, *60°C/140°F*, *63°C/145°F*, *66°C/151°F* and *70°C/158°F*.

System/CPU Temperature, CPU/System FAN Speed, Vcore, 3.3V, +5V, +12V, -12V, -5V, VBAT(V), 5VSB(V)

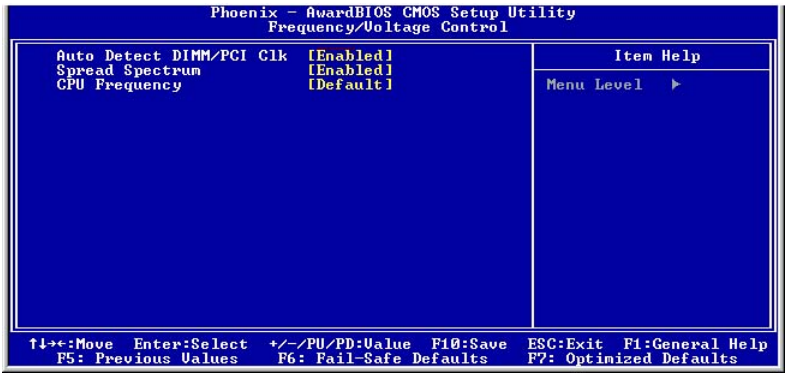
These items display the current status of all of the monitored hardware devices/components such as CPU voltages, temperatures and all fans' speeds.

Shutdown Temperature

When the processor reaches the preset temperature, the ACPI-aware system will be shut down. Settings: *Disabled*, *60°C/140°F*, *65°C/149°F*, *70°C/158°F*, *75°C/167°F*.

Frequency/Voltage Control

Use this menu to specify your settings for frequency/voltage control.


Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control
Auto Detect DIMM/PCI Clk [Enabled]
Spread Spectrum [Enabled]
CPU Frequency [Default]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Auto Detect DIMM/PCI Clk
This option allows you to enable/disable the feature of auto detecting the clock frequency of the installed DIMM/PCI bus. The settings are: *Enabled, Disabled*.

Spread Spectrum
When the motherboard's clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves. If you do not have any EMI problem, leave the setting at *Disabled* for optimal system stability and performance. But if you are plagued by EMI, activate the Spread Spectrum for EMI reduction. Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clockspeed which may just cause your overclocked processor to lock up. Options: *Disabled, Enabled*.

CPU Frequency
This option allows you to select the clock frequency of the installed CPU. The settings are: *Default, 100MHz, 133MHz, 200MHz.*

Load Fail-Safe/Optimized Defaults

The two options on the main menu allow users to restore all of the BIOS settings to the default Fail-Safe or Optimized values. The Optimized Defaults are the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard. The Fail-Safe Defaults are the default values set by the BIOS vendor for stable system performance.

When you select Load Fail-Safe Defaults, a message as below appears:

Pressing *Y* loads the BIOS default values for the most stable, minimal system performance.

When you select Load Optimized Defaults, a message as below appears:

Pressing *Y* loads the default factory settings for optimal system performance.

Set Supervisor/User Password

When you select this function, a message as below will appear on the screen:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will replace any previously set password from CMOS memory. You will be prompted to confirm the password. Retype the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.

When a password has been set, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also have BIOS to request a password each time the system is booted. This would prevent unauthorized use of your computer. The setting to determine when the password prompt is required is the Security Option of the Advanced BIOS Feature menu. If the Security Option is set to *System*, the password is required both at boot and at entry to Setup. If set to *Setup*, password prompt only occurs when you try to enter Setup.

MSI Reminds You...

About Supervisor Password & User Password:

Supervisor password:	*Can enter and change the settings of the setup menu.*
User password:	*Can only enter but do not have the right to change the settings of the setup menu.*

Appendix: Using 4- or 6-Channel Audio Function

The motherboard is equipped with Realtek ALC650/655 chip, which provides support for 6-channel audio output, including 2 Front, 2 Rear, 1 Center and 1 Subwoofer channel. ALC650/655 allows the board to attach 4 or 6 speakers for better surround sound effect. The section will tell you how to install and use 4-/6-channel audio function on the board.

TOPICS

Installing the Audio Driver *A-2*
Using 4-or 6-Channel Audio Function *A-4*
Testing the Connected Speakers *A-9*
Playing KaraOK *A-11*

Installing the Audio Driver

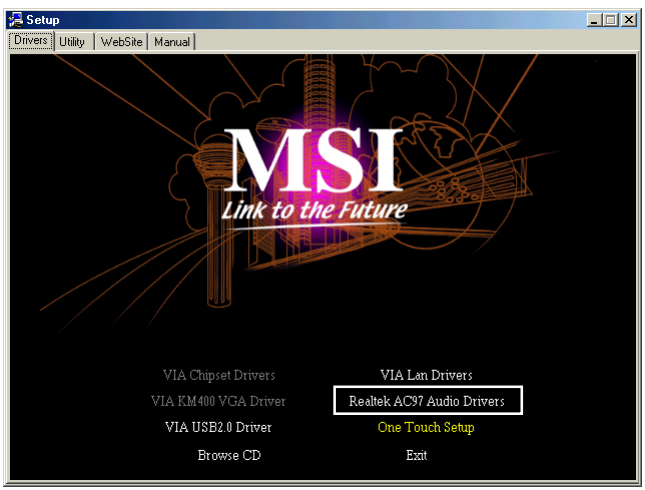
You need to install the driver for Realtek ALC650/655 chip to function properly before you can get access to 4-/6-channel audio operations. Follow the procedures described below to install the drivers for different operating systems.

Installation for Windows 98SE/ME/2000/XP

For Windows® 2000, you must install Windows® 2000 Service Pack2 or later before installing the driver.

The following illustrations are based on Windows® XP environment and could look slightly different if you install the drivers in different operating systems.

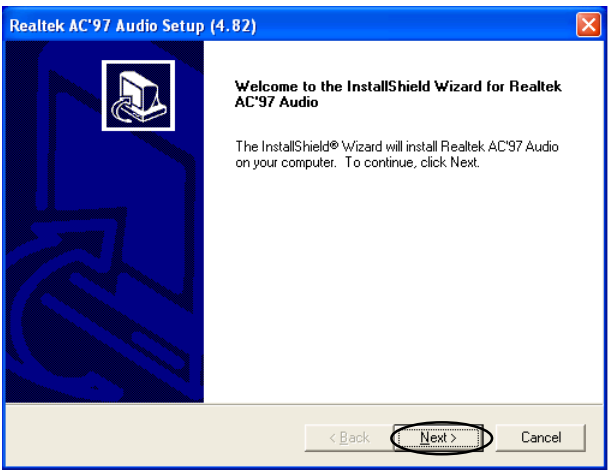
1. Insert the companion CD into the CD-ROM drive. The setup screen will automatically appear. (***Please note the screen below might be different depending on the different mainboard you purchased.)***
2. Click **Realtek AC97 Audio Drivers**.



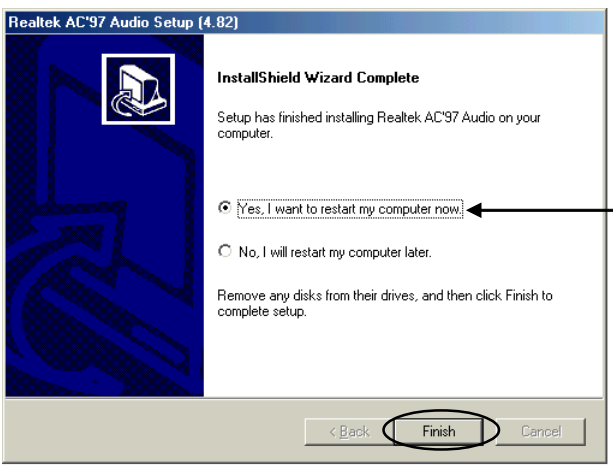
MSI Reminds You...

*The **AC97 Audio Configuration** software utility is under continuous update to enhance audio applications. Hence, the program screens shown here in this appendix may be slightly different from the latest software utility and shall be held for reference only.*

3. Click **Next** to start installing files into the system.


Realtek AC'97 Audio Setup (4.82)
Welcome to the InstallShield Wizard for Realtek AC'97 Audio
The InstallShield® Wizard will install Realtek AC'97 Audio on your computer. To continue, click Next.
< Back
Next >
Cancel

4. Click **Finish** to restart the system.


Realtek AC'97 Audio Setup (4.82)
InstallShield Wizard Complete
Setup has finished installing Realtek AC'97 Audio on your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel
Select this option

Using 4- or 6-Channel Audio Function

After installing the audio driver, you are able to use the 4-/6-channel audio feature now. To enable 4- or 6-channel audio operation, first connect 4 or 6 speakers to the appropriate audio connectors, and then select 4- or 6-channel audio setting in the software utility.

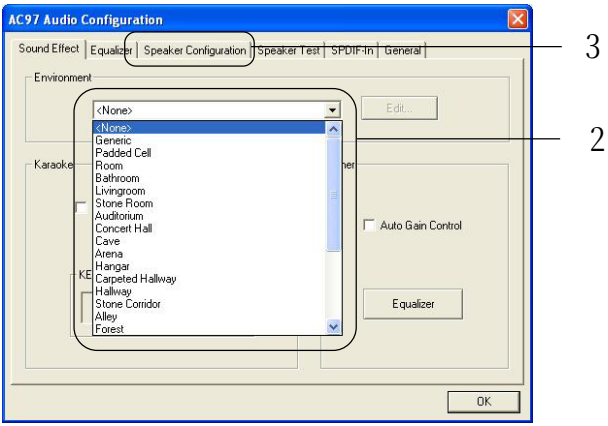
Using the Back Panel

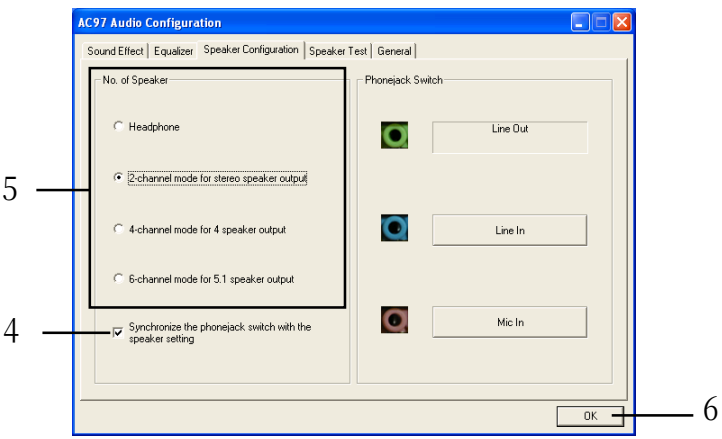
In addition to a default 2-channel analog audio output function, the audio connectors on the Back Panel also provide 4- or 6-channel analog audio output function if a proper setting is made in the software utility.

Read the following steps to have the Multi-Channel Audio Function properly set in the software utility, and have your speakers correctly connected to the Back Panel.

Configuration in the Software Utility

1. Click the audio icon from the window tray at the lower-right corner of the screen.
2. Select a desired surround sound effect from the “Environment” drop-down menu.
3. Click the **Speaker Configuration** tab.
4. Select **Synchronize the phonejack switch with the settings**.
5. Select a desired multi-channel operation from **No. of Speakers**.
   a. Headphone
   b. 2-Channel Mode for Stereo-Speaker Output
   c. 4-Channel Mode for 4-Speaker Output
   d. 6-Channel Mode for 5.1-Speaker Output
6. Click **OK** to close this window.


AC97 Audio Configuration
Sound Effect
Equalizer
Speaker Configuration
Speaker Test
SPDIF-In
General
Environment
<None>
Edit...
<None>
Generic
Padded Cell
Room
Bathroom
Livingroom
Stone Room
Auditorium
Concert Hall
Cave
Arena
Hangar
Carpeted Hallway
Hallway
Stone Corridor
Alley
Forest
Auto Gain Control
Equalizer
OK
3
2


AC97 Audio Configuration
Sound Effect
Equalizer
Speaker Configuration
Speaker Test
General
No. of Speaker
Headphone
2-channel mode for stereo speaker output
4-channel mode for 4 speaker output
6-channel mode for 5.1 speaker output
Synchronize the phonejack switch with the speaker setting
Phonejack Switch
Line Out
Line In
Mic In
OK
5
4
6

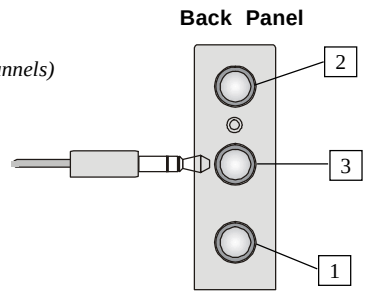
Connecting the Speakers

When you have set the Multi-Channel Audio Function mode properly in the software utility, connect your speakers to the correct phone jacks in accordance with the setting in software utility.

■ **2-Channel Mode for Stereo-Speaker Output**

Refer to the following diagram and caption for the function of each phone jack on the back panel when 2-Channel Mode is selected.

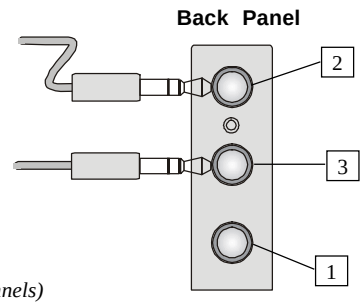
1 MIC
2 Line In
3 Line Out *(Front channels)*



■ 4-Channel Mode for 4-Speaker Output

The audio jacks on the back panel always provide 2-channel analog audio output function, however these audio jacks can be transformed to 4- or 6- channel analog audio jacks by selecting the corresponding multi-channel operation from **No. of Speakers**.

Refer to the following diagram and caption for the function of each jack on the back panel when 4-Channel Mode is selected.



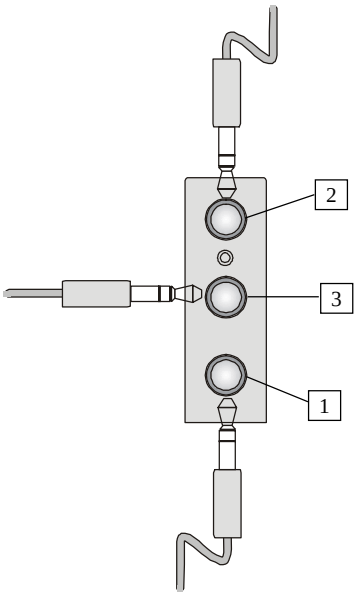
1 MIC
2 * Line Out *(Rear channels)*
3 Line Out *(Front channels)*

* Line In function is converted to Line Out function when 4-Channel Mode for 4-Speaker Output is selected.

■ 6-Channel Mode for 6-Speaker Output

Refer to the following diagram and caption for the function of each jack on the back panel when 6-Channel Mode is selected.

Back Panel



1 Line Out *(Center and Subwoofer channel)*
2* Line Out *(Rear channels)*
3* Line Out *(Front channels)*

* Both Line In and MIC function are converted to Line Out function when 4-Channel Mode for 6-Speaker Output is selected.

MSI Reminds You...

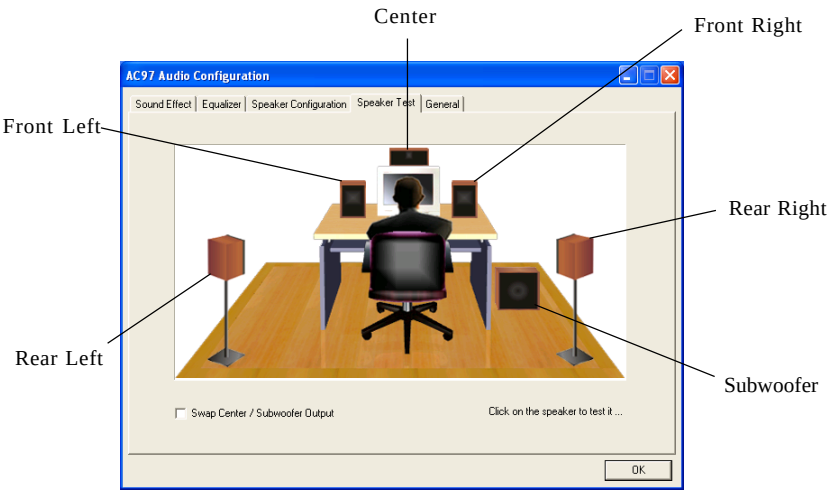
If the Center and Subwoofer speaker exchange their audio channels when you play video or music on the computer, a converter may be required to exchange center and subwoofer audio signals. You can purchase the converter from a speaker store.

Testing the Connected Speakers

To ensure that 4- or 6-channel audio operation works properly, you may need to test each connected speaker to make sure every speaker work properly. If any speaker fails to make sound, then check whether the cable is inserted firmly to the connector or replace the bad speakers with good ones.

Testing Each Speaker

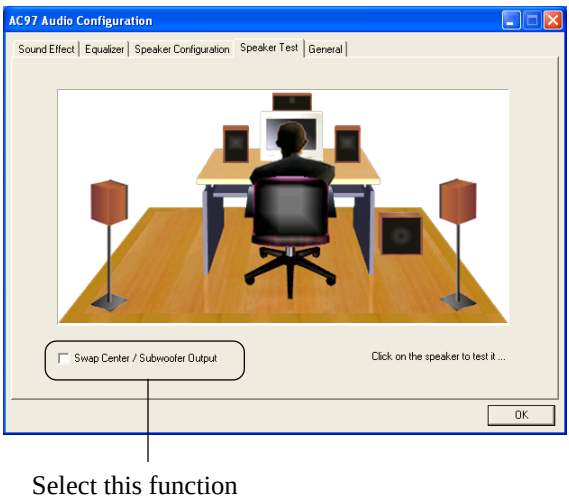
1. Click the audio icon from the window tray at the lower-right corner of the screen.
2. Click the **Speaker Test** tab.
3. The following window appears. Select the speaker which you want to test by clicking it.



MSI Reminds You...

6 speakers appear on the "Speaker Test" window only when you select "6-Channel Mode" in the "No. of Speakers" column. If you select "4-Channel Mode", only 4 speakers appear on the window.

4. While you are testing the speakers in 6-Channel Mode, if the sound coming from the center speaker and subwoofer is swapped, you should select **Swap Center/Subwoofer Output** to readjust these two channels**.**



Select this function

Playing KaraOK

The KaraOK function will automatically remove human voice (lyrics) and leave melody for you to sing the song. Note that this function applies only for 2-channel audio operation.

Playing KaraOK

1. Click the audio icon from the window tray at the lower-right corner of the screen.
2. In the Sound Effect tab, select **Voice Cancellation** under "KaraOK."
3. Click **OK** to close this window.